REMARKS

Applicants note that the arguments received on June 30, 2004 by the Examiner have been carefully considered but are not deemed persuasive because of the teaching of the cited reference, according to the Examiner, reads on all the rejected claims as set forth in the previous rejection. Therefore, the Examiner has made this Office Action final.

The Examiner states that contrary to the assertions at pages 1-12 of the arguments, claims 1, 2, 5, 7, 9 and 10 are not patentable. Further the Examiner states the claim does not require or limit as during examination the USPTO must give claims their broadest reasonable interpretation. The Examiner suggests that Applicants should submit an argument under the heading "Remarks" pointing out disagreements with the Examiner's contentions. In addition, the Examiner suggests Applicants must also discuss the references applied against the claims, explaining how the claims avoid the references or distinguish from them.

The Examiner contends in response to Applicants' arguments that there is no suggestion to combine the references, the Examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, directing Applicants' attention to *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). The Examiner states in this case the reference (Norin et al U. S. Patent No. 6,157,817) teaches in-orbit multiple receive antenna pattern testing with telemetry circuitry onboard the satellite measures the power level of the uplink signal received and converts it to a corresponding digital value and then that Norin further improve teaching by (U. S. Patent No. 6,233,433) that teaches downlink antenna pattern which transmits from the satellite. Therefore, according to the Examiner, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Norin '817 as taught by Norin '433, provide the motivation to improve reducing the in-orbit testing time and cost in satellite communication system.

Regarding claim 1, the Examiner states that Applicants argue that the combination of Norin et al (U. S. Patent No. 6,157,817) and Norin (U. S. Patent No. 6,233,433) do not teach the claimed invention "slewing the satellite over orientation angles using a slow constant attitude translation." However, the Examiner respectfully disagrees with Applicants' assertion that Norin '817 and Norin '433 do not teach the claimed invention. Contrary to Applicants' assertion, the Examiner is of the opinion that Norin '817 teaches the satellite position is slewed over angles (orientation angles) which encompass the area of

reception of receive antenna and slewing is accomplished by incrementally adjusting (constant attitude translation) the satellite roll and pitch orientation (directing Applicants' attention to Fig. 2 and col. 4, line 65 to col. 5, line 12) regarding the claimed limitation. Also, Applicants argue that the claimed limitation "sensing a power level of the test signal on-board the satellite during slewing" does not teach by Norin. However, the Examiner respectfully disagrees with Applicants' assertion. Contrary to Applicants' assertion, the Examiner is of the opinion that Norin '817 teaches telemetry circuitry converts the sensed uplink signal power levels to digital code for transmission in the telemetry data stream (signal on-board) returned to the ground test station during slewing (directing Applicants' attention to col. 6, lines 17-32 and Figs. 1, 7) regarding the claimed limitation. In addition, Applicants argue that Norin does not teach the claimed limitation "processing the sensed power level and said orientation angles to verify the operation of said receive antenna on the satellite." However, the Examiner respectfully disagrees with Applicants' assertion. Contrary to Applicants' assertion, the Examiner is of the opinion that Norin '817 teaches the satellite antenna configured to perform sensed power levels and orientation angles for testing procedure (directing Applicants' attention to col. 4, line 25 to col. 5, line 12 and Figs. 1, 2), regarding the claimed limitation. Finally, the combination of Norin '817 and Norin '433 does not teach the claimed invention "transmitting downlink telemetry comprising sensed power level and orientation angles of the satellite from the satellite to a telemetry and command earth station that is located at a geographically separate location from the payload test earth station." However, the Examiner respectfully disagrees with Applicants' assertion. Contrary to Applicants' assertion, the Examiner is of the opinion that Norin '817 teaches transmitting downlink telemetry signal by telemetry circuit in the satellite for sensing the power level of received test signal and converts it to a digital code and slewing orientation angle as the satellite is slewed (directing Applicants' attention to col. 4, line 25 to col. 5, line 12 and Figs. 1, 2) and communicating with ground test earth station and also communication with command earth station that is obviously geographically separate location from the ground test earth station (directing Applicants' attention to col. 4, line 25 to col. 5, line 12 and Figs. 1, 2). Also, the Examiner contends Norin '433 teaches a ground command earth station and ground test earth station that is separated geographical location from the ground earth station (directing Applicants' attention to Figs. 1, 4, col. 1, lines 44-48, and col. 5, lines 1-10), it would have been obvious, according to the Examiner, to one having ordinary skill in the art at the time the invention was made to modify the Norin '817 system as taught by Norin '433, provide the motivation to improve reducing the in-orbit testing time and cost in satellite communication system, regarding the claimed limitation.

Applicants respectfully submit that in Fig. 2 and col. 4, line 65 to col. 5, line 12 there is disclosed "While the uplink test signal 3 is being received, the satellite position is slewed

"in step 72 over angles which encompass the area of reception of receive antenna 4. Slewing is accomplished by incrementally adjusting the satellite roll (elevation) and pitch (azimuth) orientation. During the test, commands are transmitted in step 74 from the ground test station to the satellite, directing it to adjust its orientation. A wide angle telemetry antenna 34 is desirable for the new test method to allow a continuous transmission of telemetry data to be returned to the ground station as the satellite is slewed. Slewing an in-orbit satellite's position to validate the contour of a shaped antenna is described in Egly et al., "In-Orbit Test of the First Hughes United States Direct Broadcast Satellite", *International Journal of Satellite Communications,* Vol. 13, No. 5, September-October 1995, pages 306-307."

Further, Applicants respectfully contend at col. 6, lines 17-32 and Figs. 1, 7 there is disclosed "The satellite position is slewed over angles which encompass the receive antennas' collective area of reception. Figs. 7a-7c illustrate uplink beams 88 and 90 simultaneously transmitted from ground test antenna 44 as a satellite having two receive antennas, 4a and 4b, is rotated in azimuth. As described above for a single receive antenna, as antennas 4a and 4b approach alignment with test antenna 44 the power level of their respective received uplink signals 3a and 3b increases. Telemetry circuitry 26 converts the sensed uplink signal power levels to digital code for transmission in the telemetry data stream 30 returned to the ground test station during slewing. The two receive antenna patterns are mapped as described for the single antenna test method. This allows multiple receive antennas to be tested simultaneously from a single ground test station, reducing the time required to complete the tests."

Further, Applicants submit at col. 4, line 25 to col. 5, line 12 and Figs. 1, 2 there is disclosed "The ground test station shown in Fig. 1 includes a signal generator 38 for generating uplink test signals, an amplifier 40 to increase the power of the signal for transmission, and a decoder 42 to translate the telemetry data stream. A ground test antenna 44 provides the link between the in-orbit satellite and the ground test station. The test antenna 44 transmits the uplink signal to the satellite and receives the telemetry stream and downlink signal from the satellite. A computer 46 stores the translated position and signal information from the telemetry data stream for later processing. At the conclusion of the test, the computer plots the power levels of the received downlink signals as a function of the satellite's position to produce a map of the receive antenna pattern. The map is used to verify the integrity of the receive antenna after launch.

"......The received uplink test signal 3 is amplified and converted by receiver 2 to a corresponding downlink signal 11 in step 60, and then filtered by input channel filter 6 to remove other signals in step 58. Telemetry circuitry 26 senses the power level of the received test signal and converts it to a digital code in step 62."

At col. 4, line 25 to col. 5, line 12 and Figs. 1, 2 is set out above by Applicants.

In Figs. 1, 4 and col. 1, lines 44-48 and col. 5, lines 1-10 in Norin '433 there is disclosed "A test signal is transmitted from ground station 2, amplified, and rebroadcast in downlink beams (8a-8d), which are sampled within their respective areas of coverage (10a-10d). In the example shown in Fig. 1, four test stations, one within each downlink beam, are required to receive downlink signals corresponding to the uplink test signal."

And at col. 5, lines 1-10 in Norin '433 there is set out "Prior tests required an uplink signal to be transmitted from multiple uplink sites and downlink signals were received at test stations within each downlink beam. By sampling and combining multiple downlink signals prior to transmission, and transmitting the combined downlink signal from a wide angle transmit antenna, all of the channels fed by the receive antenna can be tested from a single test station. After testing the transponders fed by the receive antenna, commands are transmitted directing another receive antenna to be aligned with the test station antenna."

Applicants respectfully submit that although in Fig. 2 and col. 4, line 65 to col. 5, line 12 slewing is described in general terms, there is no teaching, suggestion or implication that the slewing of the satellite is performed over orientation angles using a slow constant attitude translation as required in the second element of claim 1. Further, at col. 6, lines 17-32 and in Figs. 1, 7 of Norin '817 although it is stated the power level of the respective received uplink signals 3a and 3b increases and that telemetry circuitry 26 converts the sensed uplink signal power levels to digital code for transmission in the telemetry data stream 30 returned to the ground test station during slewing, this does not disclose sensing a power level of the test signal on-board the satellite during slewing as required by element 3 of claim 1.

Further, at col. 4, line 25 to col. 5, line 12 and in Figs. 1, 2 although there is disclosed a signal generator 38 for generating uplink test signals, an amplifier 40 to increase the power of the signal for transmission, and a decoder 42 to translate the telemetry data stream and the computer plots the power levels of the received downlink signals as a function of the satellite's position to produce a map of the receive antenna pattern and, at line 48, telemetry circuitry 26 senses the power level of the received test signal and converts it to a digital code in step 62, this does not teach, suggest or imply processing the sensed power level and said orientation angles to verify the operation of said receive antenna on the satellite as required by element 5 of claim 1. Further, at the same sections of Norin '817 relied upon by the Examiner, there is not taught in addition to transmitting downlink telemetry comprising sensed power level and orientation angles of the satellite from the satellite to a telemetry and command earth station that is "located" at a geographically separate location from the payload test earth station as required by element

4 of claim 1. Further, Applicants respectfully disagree with the Examiner that at the same recitation in Norin '817 there is taught transmitting downlink telemetry signal by telemetry circuit in the satellite for sensing the power level of received test signal and converts it to a digital code and slewing orientation angle as the satellite is slewed, does not teach, suggest or imply transmitting downlink telemetry comprising sensed power level and orientation angles of the satellite from the satellite to a telemetry and command earth station that is located at a geographically separate location from the payload test earth station. Applicants respectfully disagree with the Examiner that the ground test earth station and also communication with command earth station is obviously in a geographically separate location from the ground test station citing the same recited passage of Norin '817. In addition, Applicants respectfully contend that Norin '433 in Fig. 1, 4 and at col. 1, lines 44-48 and col. 5, lines 1-10 do not teach, suggest or imply that a ground command earth station and ground test earth station are separated geographically from the ground command earth station. Merely indicated therein at col. 1 is that ground test stations are portable and at col. 5 that uplink signals to be transmitted from multiple uplink sites and downlink signals were received at test stations within each downlink beam so that by sampling and combining multiple downlink signals prior to transmission and transmitting the combined downlink signal from a wide angle transmit antenna, all of the channels fed by the receive antenna can be tested from a single test station.

Therefore, Applicants respectfully disagree that it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Norin '817 as taught by Norin '433 to provide the motivation to improve reducing the in-orbit testing time and cost in satellite communication system regarding claim limitation. This is no where to be found in either of Norin '817 or Norin '433 in any combination.

Regarding claim 2 Applicant argues that the combination of Norin '817 and Norin '433 does not teach the claimed invention "processing the noise power level and orientation angles to verify operation of the transmit antenna on the satellite." However, the Examiner respectfully disagrees with Applicants' assertion. Contrary to Applicants' assertion, the Examiner is of the opinion that Norin '817 teaches the satellite antenna configured to perform sensed power levels and orientation angles for the downlink signals to avoid interference. As avoiding interference for downlink signal, the low noise amplifier with filter in the satellite inherently measures and performs to reduce the noise power levels and adjusting orientation angles to operate of the transmit antenna (see col. 4, line 25 to col. 5, line 12, Figs. 1, 2, and col. 3, line 47 to col. 4, line 4). Also, Norin '433 teaches using a switching matrix (processing the noise power for operation of the transmit antenna) is that it reduces the adding unwanted noise to the combined signal and providing a method of testing individual channels, directing Applicants' attention to col. 2, line 64 to col. 3, line 35

and Figs. 2, 3 regarding the claimed limitation. Applicants also argue that the combination of Norin '817 and Norin '433 does not teach the claimed invention "measuring downlink noise in a small bandwidth at the telemetry and command earth station while the satellite is translated." However, the Examiner respectfully disagrees with Applicants' assertion. Contrary to Applicants' assertion, the Examiner is of the opinion that Norin '817 teaches the satellite configured to perform and measure sensed power levels with interference and orientation angles for the downlink signals for avoiding interference, directing Applicants' attention to col. 4, line 25 to col. 5, line 12 and Figs. 1, 2. In addition, the Examiner states Norin '433 teaches the ground station measures the received signal and a test station computer to record data corresponding to the downlink signals including information relating to signal that measuring power levels and interference or noise power levels and bandwidth information within recorded information in each downlink band during satellite is processing, directing Applicants' attention to col. 3, lines 10-58 and Figs. 3, 4 and col. 4, lines 14-65, provide the motivation to reduce the interference for broadcasting downlink signal in satellite communication system.

Applicants respectfully contend that neither at col. 4, line 25 to col. 5, line 12 or in Figs. 1, 2 nor at col. 3, line 47 to col. 4, line 4, where there is a broad ranging discussion of the ground test station shown in Fig. 1 including the use of a corresponding downlink signal 11 in step 60 which is then filtered by input channel filter 6 to remove other signals in step 58, is there any teaching, suggestion or implication that measuring downlink noise in a small bandwidth at the telemetry and command earth station while the satellite is translated as required by element 3 of claim 2. Nor is there any suggestion of this element of claim 2 at col. 2, line 64 to col. 3, line 35 and in Figs. 2, 3 in Norin '433 where there is disclosed a schematic diagram of a satellite repeater 11 in which a receive antenna 12 receives an uplink signal and feeds four transmit antennas 28a-28d as shown in Fig. 2. Nor is there any teaching, suggestion or implication in Figs. 2 or 3 and accompanying discussion in col. 3 of Norin '433 relating to measuring downlink noise in a small bandwidth at the telemetry and command earth station while the satellite is translated. Applicants respectfully submit that neither element 4 measuring downlink noise in a small bandwidth at the telemetry and command earth station while the satellite is translated; and element 5 processing the noise power level and orientation angles to verify operation of the transmit antenna on the satellite is taught, suggested or implied at col. 4, line 25 to col. 5, line 12 and in Figs. 1, 2 which have been amply discussed by Applicants and also conspicuously absent in Norin '433 at col. 3, lines 10-58 or in Figs. 3, 4 and col. 4, lines 14-65 where there is a broad ranging discussion that Fig. 3 is a schematic diagram illustrating the additional sampling, combining and switching circuitry that is integrated with the existing hardware, and likewise

in col. 4, lines 14-65 which sets out a broad ranging discussion of a sample communications satellite test configuration as shown in Fig. 4.

In summary, Applicants take the position with regard to elements 3 and 4 of claim 2 relating to measuring and processing, respectively, that there is no teaching, suggestion or implication of measuring the downlink noise in a small bandwidth as set out in element 3 nor is there processing the noise power level and orientation angles to verify operation of the transmit antenna on the satellite as required by element 4 of claim 2.

Regarding claims 3 and 4 Applicants argue that the combination of Norin '817 and Norin '433 does not teach the claimed invention "the uplink commands cause a slow constant attitude translation and a discrete steps in attitude translation of the satellite." However, the Examiner respectfully disagrees with Applicants' assertion. Contrary to Applicants' assertion, the Examiner is of the opinion that Norin '817 teaches during the test the commands are transmitted from the ground test station to the satellite, directing it to adjust its orientation and normal operation, such that constant translation power level (discrete steps) to digital code, directing Applicants' attention to col. 4, line 25 to col. 5, line 50 and Figs. 1, 3, regarding the claim limitation.

Applicants respectfully contend that at col. 4, line 25 to col. 5, line 50 and Figs. 1, 3 there is a broad ranging discussion of the ground test station shown in Fig. 1, the test antenna 44 transmitting the uplink signal to the satellite, computer plots the power level of receive downlink signals as a function of the satellite's position, the received uplink test signal is filtered by input channel filter 6 and slewing is accomplished by incrementally adjusting the satellite roll and pitch orientation, in addition to a discussion of the operations of the systems in Figs. 3a-3e and Figs. 4a-4e.

Applicants respectfully submit and maintain that in none of these disclosures is there to be found the slow constant attitude translation of the satellite required in claim 3 nor the uplink commands cause a discrete steps in attitude translation as required in claim 4 as previously contended. A general discussion of the ground test station as depicted in Fig. 1 and a general discussion of slewing and the satellite's position as depicted in Figs. 3a-3e and the satellite's elevational rotation as depicted in Figs. 4a-4e does not in any way teach, suggest or imply the method as depicted in claim 2 wherein the uplinked commands cause a slow constant attitude translation of the satellite as required in claim 3 nor the method as recited in claim 2 wherein the uplinked commands cause a discrete steps in attitude translation as required in claim 4.

Regarding claim 5 Applicants argue that the combination of Norin '817 and Norin '433 does not teach the claimed invention "uplinking signal at different frequencies of interest from the earth station to the satellite." However, the Examiner respectfully disagrees with Applicants' assertion. Contrary to Applicants' assertion, the Examiner is of

the opinion that Norin '817 teaches the ground test station transmits to the satellite multiple uplink test signals with frequencies corresponding to the receive antenna being tested and each channel responds to uplink signals of different respective frequencies in the satellite, directing Applicants' attention to col. 6, lines 5-40 and Figs. 5, 6, regarding the claimed invention. Also, Applicants argue that the limitation "generating an input chain frequency response curve for a multibeam satellite communication system" is not taught by Norin. However, the recitation has not been given patentable weight because the recitation occurs in the preamble. According to the Examiner, a preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but instead the process steps or structural limitations are able to stand alone, directing Applicants' attention to *In re Hirao,* 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie,* 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Applicants respectfully submit that in Norin '817 at col. 6, lines 5-40 and Figs. 5, 6 there is disclosed "In an alternative embodiment, multiple receive antennas are tested simultaneously from the same ground station. A sample test configuration with two transponders is shown in Fig. 6.....As previously discussed, each channel responds to uplink signals of different respective frequencies. The new test method allows multiple receive antennas to be tested simultaneously.......

".....Telemetry circuitry 26 converts the sensed uplink signal power levels to digital code for transmission in the telemetry data stream 30 returned to the ground test station during slewing."

Applicants respectfully submit that no where in the recited recitation relied upon by the Examiner at col. 6, lines 5-40 and in Figs. 5, 6 is there taught, suggested or implied uplinking signals at different frequencies of interest from the earth station to the satellite, generating downlink telemetry on-board the satellite that corresponds to the signal strengths of respective signals at the different frequencies as required by element 3 of claim 5; transmitting the signal strength telemetry from the satellite to the earth station as required by element 4 of claim 5; recording the signal strength telemetry and uplink frequency at the earth station as required by element 5 of claim 5; and processing the recorded signal strength telemetry and uplink frequency to produce the input power frequency response curve as required by element 6 of claim 5. The broad ranging discussion relied upon by the Examiner at col. 6, lines 5-40 and in Figs. 5, 6 in no way teaches, suggests or implies these steps as set out in claim 5.

Further, this is in no way remedied by the Examiner's argument with regard to not according the preamble any patentable weight, stating that it merely recites the purpose of a process or the intended use of a structure and where the body of the claim does not

depend on the preamble for completeness but instead the process steps or structural limitations are able to stand alone.

Applicants respectfully agree that the process steps or structural limitations are able to stand alone in claim 5 and the preamble merely sets out that by employing these process steps there results a method of generating an input chain frequency response curve for a multibeam satellite communication system which is no where to be found in the specific portions of Norin '817 relied upon by the Examiner as recited above.

Regarding claims 6 and 8 the Examiner already responded the limitation at claim 1. Applicants respectfully contend that claims 6 and 8 are patentably distinguishable over both Norin '817 and Norin '433 for those patentable distinctions drawn above with regard to claim 1 which are hereby respectfully incorporated by reference.

Regarding claims 7 and 9 the Examiner already responded the limitation at claims 2 and 5. Applicants respectfully acknowledge the Examiner's position and maintain that claims 7 and 9 are patentably distinguishable over both Norin '817 and '433 for those reasons cited above with regard to claims 2 and 5, which arguments are hereby respectfully incorporated by reference.

Regarding claim 10 in response to Applicants' arguments the recitation "generating a gain measurement of a transponder of a multibeam satellite communication system" has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure and where the body of the claim does not depend on the preamble for completeness but instead the process steps or structural limitations are able to stand alone, directing Applicants' attention to *In re Hirao,* 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie,* 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951). Also, Applicants argue that the limitation "processing the recorded noise power measurements to generate a gain measurement of the transponder." However, Norin '817 teaches a computer stores the translated position and signal information that including power level measurement and interference power measurement from the telemetry data stream and then processing and generating gain measurement of the satellite by an amplifier to increase the power of signal for transmission, more specifically, the computer plots the power levels with noise power of received downlink signals as a function of the satellite's position to produce a map (gain measurement) of receive antenna pattern, directing Applicants' attention to col. 3, line 47 to col. 4, line 64 and Figs. 1, 2, regarding the claimed limitation. Moreover, according to the Examiner, Norin '433 also teaches the ground station measures the received signal and a computer to record data including signal information, such as power level measurement and

interference power measurement, corresponding to the downlink signals, directing Applicants' attention to col. 4, lines 14-65 and Figs. 4, 5.

Applicants respectfully contend that at col. 3, line 47 to col. 4, line 64 and in Figs. 1, 2 there is merely disclosed "A schematic diagram of a sample communications satellite test configuration for a single receive antenna 4 is shown in Fig. 1.....After the uplink signal 3 is received by the receive antenna 4, the input channel filter G removes signals not within the uplink band. Within receiver 2 a low noise amplifier 8 amplifies the uplink signal 3 while adding minimal noise, and a mixer 10 converts it to a corresponding downlink signal 11......

".....satellite senses the power levels of the signals, and keeps track of the onboard equipment....

".....the satellite can receive an upon beacon transmitted from an uplink site to keep the satellite aligned as it orbits the earth....

".....At the conclusion of the test, the computer plots the power levels of the received downlink signals as a function of the satellite's position to produce a map of the receive antenna pattern....

".....The ground test station receives and decodes the telemetry data stream in step 68, and uses the information to map the receive antenna's area of reception in step 70."

Applicants respectfully submit that no where in the recitation relied upon by the Examiner in Norin '817 is there taught, suggested or implied the combination of positioning a downlink beam over an earth station in combination with measuring noise power of the downlink beam over a small bandwidth at a selected frequency at the earth station and processing the recorded noise power measurements to generate a gain measurement of the transponder. Applicants are at a loss to discern where in all of col. 3, line 47 to col. 4, line 64 and in Figs. 1, 2 of Norin '817 where these limitations of claim 10 are to be found. Furthermore, Applicants respectfully contend that at col. 4, lines 14-65 and in Figs. 4, 5 of Norin '433 there is merely disclosed "A sample communications satellite test configuration is shown in Fig. 4" and in a broad ranging discussion at line 24 discloses "A flow diagram of the new method of testing satellite transponders after launch from a single ground test station is shown in Fig. 5 for the test configuration of Fig. 4.....The received uplink test signals are converted to corresponding downlink signals by mixer 18, and distributed by divider network 20 through input channel filters 14a-14d to their respective multiple channel amplifiers 22a-22d, four in this example (step 54)....

"The downlink signal 63 received by the ground test antenna 44 is measured by test equipment 46 such as a spectrum analyzer, frequency counter, group delay analyzer, power meter, or other measurement device, and information relating to the signal is recorded by the test station computer 48 for later processing (step 72).....The information

"extracted from the returned downlink signal may be used to verify the operation of each channel after launch."

Applicants respectfully contend that these recitations do little to cure the deficiencies as recited above with regard to Norin '817 and in no way teach, suggest or imply measuring noise power of the downlink beam over a small bandwidth at a selected frequency at the earth station; and processing the recorded noise power measurements to generate a gain measurement of the transponder, as required by elements 2 and 3 of claim 10. Applicants respectfully contend that the preamble setting out the environment of the claimed method for generating a gain measurement of a transponder of a multibeam satellite communication system is what results from practicing the steps as outlined in elements 1-3 of claim 10 regarding positioning...measuring....and processing... It is Applicants' position that these process steps are patentably distinguishable over the recitations relied upon by the Examiner in both Norin '817 and Norin '433 without resort to patentable weight being given to the preamble. Applicants respectfully contend that the recitations relied upon by the Examiner, however, do not in any way relate to a method of generating gain measurement of a transponder of a multibeam satellite communication system which is the result of elements 1-3 of claim 10 which are not to be found in either of the recitations relied upon by the Examiner in either of Norin '817 or Norin '433.

Regarding claim 11 the Examiner already responded to the limitation at claim 2 and directs Applicants' attention to the rejection below for the reasons as to why this limitation is not patentable. Applicants acknowledge the Examiner's position and will deal with this rejection with regard to the 35 U.S.C. 103 rejections which follow.

The Examiner has rejected claims 1-11 under 35 U.S.C. 103(a) as being unpatentable over Norin et al U. S. Patent No. 6,157,817 in view of Norin U. S. Patent No. 6,233,433.

The Examiner states regarding claim 1, Norin '817 discloses that a method of testing a satellite (Fig. 1) receive antenna (4 in Fig. 1) of a multibeam satellite system (Fig. 1 and col. 3, line 47 to col. 4, line 24). The Examiner further states that Norin '817 discloses that uplinking a test signal (3 in Fig. 1) from a payload test earth station (Fig. 1) to the receive antenna (4 in Fig. 1) (Fig. 1 and col. 4, lines 5-50). Further, the Examiner states that Norin '817 discloses that slewing the satellite over orientation angles using a slow constant attitude translation (Figs. 1, 2, abstract and col. 4, lines 5-24, where teaches the satellite's position is slewed over angles approximately covering the receive antenna areas of reception). The Examiner further contends that Norin '817 discloses that sensing a power level of the test signal on-board the satellite during slewing (Figs. 1, 2, abstract and col. 4, line 5 to col. 5, line 13, where teaches telemetry circuitry onboard the satellite senses the power levels of the signals and keeps track of the onboard equipment). The

Examiner goes on to say Norin '817 discloses that transmitting downlink telemetry comprising sensed power level and orientation angles of the satellite from the satellite to the payload test earth station (Figs. 1, 2 and col. 3, line 47 to col. 4, line 23, where teaches the satellite transmits downlink telemetry, power levels, angles, and other data to transmission back to earth). The Examiner concludes by saying that Norin '817 discloses that processing the sensed power level and said orientation angles to verify the operation of said receive antenna on the satellite (col. 4, line 25 to col. 5, line 13 and Figs. 1, 2, where teaches the satellite receive antenna configures and processes the slewing angles and sensed power levels).

The Examiner states that Norin '817 does not specifically disclose the limitation "transmitting downlink telemetry from the satellite to a telemetry and command earth station that is located at a geographically separate location from the payload test earth station." However, the Examiner contends Norin '433 discloses the limitation "transmitting downlink telemetry from the satellite to a telemetry and command earth station that is located at a geographically separate location from the payload test earth station" (col. 1, lines 44-48, Figs. 4, 5 and col. 4, line 14 to col. 5, line 17, where teaches prior tests required an uplink signal to be transmitted from multiple uplink sites and downlink signals were received at test stations within each downlink beam). According to the Examiner, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the Norin '817 system as taught by Norin '433 thus allowing measurements at multiple points in coverage area as discussed by Norin '433, col. 1, lines 50-55.

Applicants respectfully submit that although they do not agree that Norin '817 discloses the method of testing a satellite at Fig. 1 receive antenna (4 in Fig. 1) of a multibeam satellite system (Fig. 1 and col. 3, line 47 to col. 4, line 24), this method is totally distinguishable from that as set out in Fig. 1. Likewise, Applicants respectfully contend that they do not necessarily agree that Norin '817 discloses uplinking a test signal (3 in Fig. 1) from a payload test earth station (Fig. 1) to the receive antenna (4 in Fig. 1) (Fig. 1 and col. 4, lines 5-50). Nevertheless, this disclosure is patentably distinguishable from uplinking of the test signal in the method as defined in claim 1. Likewise, although Applicants do not necessarily agree with the following: Norin '817 discloses that slewing the satellite over orientation angles using a slow constant attitude translation (Figs. 1, 2, abstract and col. 4, lines 5-24, where teaches the satellite's position is slewed over angles approximately covering the receive antenna areas of reception); Norin '817 discloses that sensing a power level of the test signal on-board the satellite during slewing (Figs. 1, 2, abstract and col. 4, line 5 to col. 5, line 13, where teaches telemetry circuitry onboard the satellite senses the power levels of the signals and keeps track of the onboard equipment); Norin '817 discloses that transmitting downlink telemetry comprising sensed power level and

orientation angles of the satellite from the satellite to the payload test earth station (Figs. 1, 2 and col. 3, line 47 to col. 4, line 23, where teaches the satellite transmits downlink telemetry, power levels, angles, and other data to transmission back to earth); Norin '817 discloses that processing the sensed power level and said orientation angles to verify the operation of said receive antenna on the satellite (col. 4, line 25 to col. 5, line 13 and Figs. 1, 2, where teaches the satellite receive antenna configures and processes the slewing angles and sensed power levels); nevertheless, all of the various operations relied upon by the Examiner are patentably distinguishable from those as set out in the method of claim 1 requiring a patentably distinguishable uplinking, slewing, sensing, transmitting and processing step as defined therein.

Applicants gratefully acknowledge that the Examiner admits that Norin '817 does not specifically disclose the limitation "transmitting downlink telemetry from the satellite to a telemetry and command earth station that is located at a geographically separate location from the payload test earth station." However, Applicants respectfully submit that this is not remedied by Norin '433 at col. 1, lines 44-48 or in Figs., 4, 5 or col. 4, line 14 to col. 5, line 17 where there is a discussion "A test signal is transmitted from ground station 2, amplified, and rebroadcast in downlink beams (8a-8d), which are sampled within their respective areas of coverage (10a-10d).....Usually the ground test stations are portable so that the downlink signal can be measured from multiple points within the area of coverage" and, further, in col. 4-col. 5 as recited by the Examiner wherein there is disclosed a broad ranging discussion of "A sample communications satellite test configuration is shown in Fig. 4. The single ground test station includes a signal generator 38 for generating uplink test signals, a high power amplifier 42 for increasing the power of the uplink signals prior to transmission, and a test antenna 44 which transmits test signals 40 and receives corresponding downlink signals......and

"By aligning each receive antenna with the test station antenna and transmitting a combined downlink signal from the broad range transmit antenna, the entire satellite repeater can be tested from a single ground test station."

Although Applicants do not necessarily agree that in Norin '433 at col. 1, lines 50-55 there is disclosure allowing measurements at multiple points in coverage area, this does little to cure the deficiencies of Norin '817. For the reasons cited above which are hereby incorporated by reference, Applicants respectfully submit that they disagree that it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the Norin '817 system as taught by Norin '433.

Regarding claim 2, the Examiner contends that Norin '817 and Norin '433 disclose all the limitations, as discussed in claim 1. Furthermore, the Examiner contends Norin '817 further discloses that processing the noise power level and orientation angles to verify

operation of the transmit antenna (24 in Fig. 1) on the satellite (col. 4, line 14 to col. 5, line 17 and Figs. 4, 5). However, the Examiner admits that Norin '817 does not specifically disclose the limitation "measuring downlink noise in a small bandwidth at the telemetry and command earth station while the satellite is translated." However, the Examiner contends that Norin '433 discloses the limitation "measuring downlink noise in a small bandwidth at the telemetry and command earth station while the satellite is translated" (col. 4, line 14 to col. 5, line 23, abstract, and Figs. 4, 5, where teaches received downlink signal is measured and recorded the signal information, power level within each downlink band, for reducing possibility of adding unwanted noise). The Examiner concludes it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the Norin '817 system as taught by Norin '433, the motivation to do so being to achieve reducing unwanted noise by performing in-orbit satellite tests in satellite communication system.

Applicants respectfully contend that although they do not necessarily agree with the Examiner regarding the teachings in Fig. 1; at col. 4, line 14 to col. 5, line 17, and Figs. 4, 5 and at col. 4, line 14 to col. 5, line 23, abstract, and Figs. 4, 5, nevertheless claim 2 is otherwise patentably distinguishable over both Norin '817 and Norin '433 since no where in either of the recited teachings of these references relied upon by the Examiner is there to be taught, suggested or implied measuring downlink noise in a small bandwidth of the telemetry and command earth station while the satellite is translated, as required by element 3 of claim 2, and processing the noise power level and orientation angles to verify operation of the transmit antenna on the satellite. Applicants respectfully contend that, in fact, measuring downlink noise in a small bandwidth is no where taught, suggested or implied and, likewise, neither is processing the noise power level and orientation angles as required in both elements 3 and 4 of claim 2.

Regarding claim 3, according to the Examiner Norin '817 discloses that the uplinked commands cause a slow constant attitude translation of the satellite (col. 4, lines 5-24 and Fig. 1).

Applicants respectfully disagree that the disclosure therein relied upon and more specifically at line 19 "the satellite can receive an uplink beacon transmitted from an uplink site to keep the satellite aligned as it orbits the earth" in any way suggests, teaches or discloses that the uplink commands cause a slow constant attitude translation of the satellite. Applicants are at a loss to discern how the uplink commands cause a slow constant attitude translation of the satellite is in any way disclosed or taught in said recitation and request clarification as to the specific portions of the reference relied upon to disclose this limitation.

Regarding claim 4, the Examiner contends that Norin '817 discloses that the uplinked commands cause a discrete steps (power levels) in attitude translation of the satellite (col. 4, lines 5-39 and Fig. 1).

Applicants respectfully disagree that the broad ranging discussion in col. 4, lines 5-39 and Fig. 1 which relate to a general discussion of satellite transmission telemetry data streams including satellite orientation, temperature, signal power, status and other data...."At the conclusion of the test, the computer plots the power levels of the received downlink signals as a function of the satellite's position to produce a map of the receive antenna pattern." in any way teach, suggest or disclose that the uplink commands cause a discrete steps in attitude translation of the satellite. Again, Applicants are unable to find any reference to causing discrete steps in attitude translation for the processes disclosed and relied upon by the Examiner.

Regarding claim 5, the Examiner contends that Norin '817 and Norin '433 disclose all the limitations as discussed in claims 1 and 2. Furthermore, according to the Examiner, Norin '817 further discloses that positioning an uplink beam is over an earth station (col. 2, line 36 to col. 3, line 2 and Fig. 1). The Examiner further contends that Norin '817 teaches that uplinking signals at different frequencies of interest from the earth station to the satellite (col. 6, lines 4-33 and Figs. 5, 6, where teaches received uplink signals of different respective frequencies from ground station). The Examiner goes on to say that Norin '817 teaches that generating downlink telemetry on-board the satellite that corresponds to the signal strengths of respective signals at the different frequencies (col. 4, lines 5-64, Figs. 1, 6 and col. 6, lines 4-33, where teaches computer generate downlink telemetry (power levels) of different respective frequencies). Further, the Examiner states that Norin '817 teaches that recording the signal strength telemetry and uplink frequency at the earth station (col. 4, lines 25-64 and Fig. 1, where teaches the ground station stores the translated position and signal information from telemetry data stream). The Examiner further contends that Norin '817 teaches that processing the recorded signal strength telemetry and uplink frequency to produce the input power frequency response curve (col. 4, lines 25-64 and Fig. 1, where teaches the ground station stores the translated position and signal information from telemetry data stream for processing, computer plots the power levels as a function of the satellite's position to produce a map of the receive antenna pattern).

Applicants respectfully disagree that Norin '817 and Norin '433 disclose all the limitations as discussed in claims 1 and 2 for reasons recited above with regard to claims 1 and 2 which are hereby respectfully incorporated by reference. Further, Applicants respectfully contend that although they do not necessarily agree with the Examiner's assessments of the teachings at the recited portions of Norin '817 at col. 2, line 36 to col. 3,

line 2 and Fig. 1, col. 6, lines 4-33 and Figs. 5, 6, col. 4, lines 5-64 and Figs. 1, 6, col. 6, lines 4-33, and col. 4, lines 25-64 and Fig. 1, nevertheless, claim 5 is patentably distinguishable over both Norin '817 and Norin '433 for those reasons cited above with regard to claims 1 and 2 since inter alia neither of Norin '817 nor Norin '433 anywhere teach, suggest or disclose processing the recorded signal strength telemetry and uplink frequency to produce the input power frequency response curve as required by element 6 of claim 5. Further, Applicants respectfully contend that no where in either of Norin '817 or Norin '433 are the combination of the six elements of the method as set out in claim 5 to be taught, suggested or implied and consequently rendered obvious under 35 U.S.C. 103.

The Examiner states regarding claims 6 and 8, Norin '817 and Norin '433 disclose all the limitations as discussed in claims 1 and 2.

Applicants respectfully disagree that all the limitations as discussed in claims 1 and 2 are taught in Norin '817 and Norin '433 as applied to claims 6 and 8 and respectfully contend that claims 6 and 8 are patentably distinguishable over Norin '817 and Norin '433 for those patentable distinctions drawn above with regard to claims 1 and 2 over said references which are hereby respectfully incorporated by reference.

Regarding claim 7, the Examiner states Norin '817 and Norin '433 disclose all the limitations as discussed in claims 1 and 5. Furthermore, the Examiner contends that Norin '817 further discloses that processing the recorded signal strength telemetry to produce the input chain transfer curve corresponding to input power frequency response (col. 4, lines 25-64 and Figs. 1, 3f, where teaches the ground station stores the translated position and signal information from telemetry data stream for processing, computer plots the power levels as a function of the satellite's position to produce a map of the receive antenna pattern).

Applicants respectfully disagree that Norin '817 and Norin '433 disclose all the limitations in claims 1 and 5 for reasons discussed above with regard to claims 1 and 5 which are hereby respectfully incorporated by reference. Furthermore, Applicants respectfully contend that although they do not necessarily agree with the Examiner's contentions regarding the disclosures at col. 4, lines 25-64 and in Figs. 1, 3f, nevertheless claim 7 is patentably distinguishable over Norin '817 and Norin '433 since in neither reference is there suggested, taught, implied or rendered obvious inter alia processing the recorded signal strength telemetry to produce the input chain transfer curve corresponding to input power frequency response. Applicants respectfully contend that no where in either reference is there taught or rendered obvious the processing required to produce the input chain transfer curve corresponding to input power frequency response as required by element 6 of claim 7.

Regarding claim 9, the Examiner contends that Norin '817 and Norin '433 disclose all the limitations as discussed in claims 2 and 7. However, the Examiner admits that Norin '817 does not specifically disclose the limitation "measuring noise power of the downlink beam over a small bandwidth centered around a plurality of selected frequency of interest at the earth station." However, the Examiner submits that Norin '433 discloses the limitation "measuring noise power of the downlink beam over a small bandwidth centered around a plurality of selected frequency of interest at the earth station" (col. 4, line 14 to col. 5, line 23, abstract, and Figs. 3, 4, where teaches received downlink signal, that switched for selecting the sampled signals to be combined to produce a single combined signal/beam, is measured and recorded the signal information, power level within each downlink band, for reducing possibility of adding unwanted noise). The Examiner concludes it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the Norin '817 system as taught by Norin '433, the motivation being to achieve reducing unwanted noise by performing in-orbit satellite tests in satellite communication system.

Applicants respectfully disagree that all the limitations of claim 9 are to be found in Norin '817 and Norin '433 as discussed with regard to claims 2 and 7 for reasons cited above with regard to said claims which are hereby respectfully incorporated by reference. Applicants gratefully acknowledge that the Examiner admits that Norin '817 does not disclose "measuring noise power of the downlink beam over a small bandwidth centered around a plurality of selected frequency of interest at the earth station" as required by element 2 of claim 9. Applicants respectfully contend that this is not remedied by Norin '433 at col. 4, line 14 to col. 5, line 23, abstract, and Figs. 3, 4 wherein, as previously recited above, there is a broad ranging discussion of a sample communications satellite test configuration as shown in Fig. 4 with the only mention of noise anywhere being found in col. 5, line 18 "An advantage of using a switching matrix is that it reduces the possibility of adding unwanted noise to the combined signal." Applicants respectfully contend that this does little to cure the deficiency of Norin '817 and in no way teaches, suggests, implies or renders obvious element 2 of claim 9 "measuring noise power of the downlink beam over a small bandwidth centered around a plurality of selected frequency of interest at the earth station" and for these reasons claim 9 is likewise patentable over any combination of Norin '817 and Norin '433.

Regarding claim 10, the Examiner contends that Norin '817 and Norin '433 disclose all the limitations as discussed in claims 2 and 7. Furthermore, the Examiner contends Norin '817 further discloses that processing the recorded noise power measurements to generate a gain measurement of the transponder (col. 3, line 31 to col. 4, line 24 and Figs. 1, 2).

Applicants respectfully disagree that Norin '817 and Norin '433 disclose all the limitations as discussed with regard to claims 2 and 7 and that claim 10 is likewise patentably distinguishable over both of these references for those reasons cited with regard to claims 2 and 7 which are hereby respectfully incorporated by reference. Furthermore, Applicants respectfully contend that at col. 3, line 31 to col. 4, line 24 and Figs. 1, 2 relied upon by the Examiner wherein there is found a broad ranging discussion of multibeam communication satellites have at least one and typically multiple receive antennas each with one or more feed horns.... and at line 55 "Within receiver 2 a low noise amplifier 8 amplifies the uplink signal 3 while adding minimal noise, and a mixer 10 converts it to a corresponding downlink signal 11." Applicants respectfully contend that this is the only mention of noise as it relates to a low noise amplifier and adding minimal noise which is totally irrelevant and consequently does not teach, suggest, imply or render obvious measuring noise power of the downlink beam over a small bandwidth at a selected frequency at the earth station as required by element 2 of claim 10, nor does it teach, suggest, imply or render obvious "processing the recorded noise power measurements to generate a gain measurement of the transponder" as required by element 3 of claim 10.

The Examiner states regarding claim 11, Norin '817 and Norin '433 disclose all the limitations as discussed in claims 2 and 7.

Applicants respectfully disagree that Norin '817 and Norin '433 disclose all the limitations of claims 2 and 7 as they relate to claim 11 for reasons cited above with regard to claims 2 and 7 which are hereby respectfully incorporated by reference. Furthermore, no where in either of Norin '817 or Norin '433 is there taught, suggested, implied or rendered obvious that "the noise power of the downlink beam is measured at the center of the bandwidth at the selected frequency" as required as required by claim 11.

Applicants maintain their position with respect to the improper joinder of Norin '817 with Norin '433 to render obvious Applicants' claims since Norin '817 is directed to "A method of testing in-orbit communications satellite receive antennas from a single ground test station", while Norin '433 is directed to "The new satellite communications repeater test method allows multiple transponders to be tested from a single ground test station." Applicants respectfully submit that aside from the inventive entity Norin being common to both references, there is no motivation, suggestion or implication in either Norin '817 or Norin '433 to combine them as suggested by the Examiner aside from Applicants' own disclosure.

Applicants note that the prior art made of record and not relied upon is considered pertinent to Applicants' disclosure by the Examiner as follows: Leopold et al U. S. Patent No. 6,269,242; Tong et al U. S. patent No. 6,337,658. Applicants respectfully submit that

since these references have not been specifically applied, no further comment is warranted with regard to them.

Applicants respectfully submit that in view of the above remarks, all of the claims presently under prosecution have been shown to be patentably distinguishable over Norin '817 and Norin '433 alone or in any combination.

Accordingly, Applicants respectfully request that this application be reviewed and reconsidered in view of the above remarks and that a Notice of Allowance be issued at an early date.

Respectfully submitted,

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